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PROBLEMS AND TOOLS FOR THE DETECTION OF THREATS TO PERSONNEL SECURITY IN THE REGION¹

The study of threats negatively affecting the state and development of human resources as well as the types of security threats is of particular importance in the theory and practice of ensuring personnel security. The aim of this article is the identification and classification of the concepts of the main threats to personnel security in the region (the study is carried on the example of the Irkutsk region). On the basis of the content analysis of the Russian regulatory legal acts and scientific publications, the authors have identified external and internal threats to personnel security in the region. As a result of the study, a list of threats to personnel security in the region, which consists of 37 items, is composed. The political, economic, demographic, social, technical, technological, ecological, legal, and ethnocultural types are demonstrated. It is found that internal threats to personnel security (first of all, social and economic ones) dominate in the region. The urgency and importance of threats to personnel security in the region are assessed. The hierarchical factor analysis is used to identify types of threats (lower level factors) and to estimate their effect on the general level of the urgency of threats to personnel security (upper-level factor). It is found that legal threats and threats caused by the low labor potential of the region make the most significant effect. The following methods are used: content analysis, analysis of frequency tables and contingency tables, hierarchical factor and correlation analyses. The analysis is based on the materials of the expert survey conducted in the Irkutsk region (2015). In order to determine the correlation (coherence) of the experts' assessments, the Kendall's coefficient of concordance is calculated. The obtained results can be used for the study and identification of threats to personnel security, which are typical for a certain region, they can serve as a basis for the prediction and analysis of threats to personnel security in the region, as well as for the elaboration of countermeasures.

Keywords: region, human resources, regional security, personnel security, personnel security threats, typology of personnel security threats, acuteness of threats to personnel security, types of threats to personnel security, state of personnel security in the region

Introduction

Russian scientists do not pay sufficient attention to the study of threats to personnel security, their factors and types. At the same time, the identification of threats to personnel security in the region is important for the integrated assessment of the external and internal environment, analysis and classification of destructive factors lowering the personnel security in the region [1–4]. It is important to study threats to personnel security in the region, which are formed on the federal level, and to identify specific threats typical for a concrete region [5, p. 32]. It is of great importance to structure threats in order to present an integrated assessment of the personnel security threats, which are formed on different levels and exhibit various destructive potentials.

The objectives of the current study are the identification and typologization of concepts of the main threats to personnel security in the region.

The following tasks are to be solved in order to achieve these objectives:

- a compilation of a list of the main threats to personnel security in the region, expert assessment of the level of their acuteness;
- a construction of an empirical typology of threats to personnel security in the region using the hierarchical factor analysis.

To our opinion, the difficulty in solving these tasks are due, firstly, to the semantic and typological uncertainty of threats to personnel security, which complicates the procedure of selecting tools for their measurement, secondly, to the selected regional level of the problem under study, as distinct from the traditional microlevel, thus requiring to form the understanding of the sources of threats specific for a certain region.

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Definition of Threats to Personnel Security in the Region

As it was mentioned above, the identification and assessment of threats to personnel security in the region are new, uninvestigated problems in the Russian scientific literature. In this connection, it is necessary to study the matter of threats to personnel security, as well as the initial conception of threats to security.

Different approaches to the definition of the notion of “threats to security” are widely spread in the scientific literature, mass media, and in daily use of people.

According to one of the approaches, threats are factors (events, phenomena) affecting potentially negatively the state of the security of any object. In this case, threats can be considered as phenomena themselves (for example, criminality, terrorism), as well as their dynamics (for example, deterioration in the quality of education, health deterioration). The majority of people consider threats as a certain social problem, which an individuum (society) faces, so it can be measured by means of public opinion research, which characterizes the assessment of its relevance and degree of intensity.

With the aim of the quantitative assessment of the level of the threat and its effect on the state of security, statistical methods are used. For the determination of the degree of danger of the threats, it is proposed to form a set of specific measurable indicators for each threat, and to regularly monitor the state of the internal and external environment using these indicators. As mentioned in [6], this approach seems to be useful as directed to the assessment of both potential and real threats.

Within the framework of another approach, the threat to security is considered as a danger on the stage of transition from possibility to reality. Under this understanding of threats to security, there is a logical connection between the threat as a potential action directed to cause damage and consequences of its implementation. In this case, one should measure the mischievous intent itself, the likelihood of this damage as the key condition of the threat implementation, as well as risk predictors.

It should be specified that in order to assess the degree of threats to security in the region, this approach is restricted in use, because regional threats to security are characterized by the loss or weak intensity of the intention component. Moreover, there are such threats, which could appear, although the intention to do harm would not be formed (for example, in the case of threats of collective dismissal).

The theory of security (one more approach) considers threats as an action potentially leading to violation of security of any object or system. So, a threat to security is considered as a negative effect, which could inflict unacceptable damage on the object [7, p. 56]. This conclusion is resulting from the determination of the limits of threshold values of the object state, which characterize it as dangerous / safe. For the determination of these limits, the following terms are used: “secureness from excess danger” [8], “on the level not less than threshold values” [9], “secureness from threats, which could inflict unacceptable damage” [7]. Consequently, while assessing threats to security, the value of the damage caused should also be measured.

While identifying a threat to security, one should take into account its other characteristic features. Firstly, it has a pronounced subjective character. Secondly, the nature itself of the threat to security supposes, that in the case of its implementation, the state of the object could become worse, i.e. besides the inherent addressing of the threat, it exhibits the intention to do harm, which shows its social harmfulness. At the same time, the negative effects, depending on the character of the damage caused, could touch changes in the object’s properties, and also the necessity to eliminate the consequences of the threat. Thirdly, it has a social character, because it arises as an attitude mediated by human activities and social groups. Fourthly, the criterion to determine threats to the security of different subjects is their interests and needs. As E. E. Mikeladze states, the satisfaction of vitally important needs ensures the existence of subjects, and is the principal reason for their vigorous activity. The loss of the possibility for the subjects to pursue their interests could lead to their destruction, degradation and loss of the most important features [10, 11].

Basing on the above, the following important elements of the threats to personnel security in the region can be identified:

- subject of the threat (one who implements the threat): carriers of threats (social groups, formal and informal structures, whose activity causes threats), sources of the natural and technogenic character, phenomena, and processes;
- matter of the threat: vitally important interests of the subjects of social and labor relations (employers and employees in the region);
- object of the threat (what for the threats are directed): the system of social and labor relations;

— indicators of the threat: damage (harm) caused as a result of the implemented threat, availability of vulnerabilities in the system of protection of vitally important interests as a condition for the realizability of the threat.

As a result, a threat to personnel security in the region can be considered as a combination of conditions and factors, which create a danger to vitally important interests of the subjects of social and labor relations and hinder the development of human resources. The importance of this interpretation is connected with the fact that the development of human resources is not only a high-priority task of the State and society, but also a vitally important interest, which is common for the region and for the subjects of social and labor relations.

In the scientific literature, there are attempts to classify threats to personnel security in the region, and their types are identified, but there is no comprehensive characteristic of threats. Besides, earlier, the types of threats were not structured by the degree of their effect on the general level of personnel security.

In this connection, within the framework of the current study, the authors test the following hypothesis: all types of threats to personnel security in the region could be attributed to a limited number of threat types connected with the labor potential of the region, labor power quality, legal framework, innovation potential and life quality of the population, weaknesses and errors of the regional government in the sphere of human resource management, anticorruption efforts, and criminalization of the economy.

Data and Methods

In order to achieve the set tasks, experts representing the following spheres of professional engagement were interviewed: heads of organizations of the region, and specialists of personnel departments having experience in personnel management, heads and specialists of security departments having experience in the sphere of personnel security provision in the organization, heads and specialists of the regional government responsible for the implementation of social and labor relations in the region and provision of its personnel security (representatives of the Ministry of Labor, employment agencies, Government Labor Inspectorate, etc.), scientists dealing with problems of human resource management and provision of personnel security.

The following methods are used during the study:

1. Analysis of the information field referring to personnel security, including the compilation of a list of threats to personnel security, and their preliminary classification.

As the investigative technique, the authors used the content analysis of the state doctrines and concepts in different spheres of security, including the National Security Strategy of the Russian Federation to 2020 (approved by the Decree of the President of the Russian Federation, no. 537, on 12 May, 2009), the State Economic Security Strategy of the Russian Federation (approved by the Decree of the President of the Russian Federation, no. 608, on 29 April, 1996), the National Security Doctrine of the Russian Federation (approved by the Decree of the President of the Russian Federation, no. Pr-1895, on 9 September, 2000), the National Security Concept of the Russian Federation (approved by the Decree of the President of the Russian Federation, no. 1300, on 17 December, 1997, became invalid), the Public Security Concept of the Russian Federation (approved by the Decree of the President of the Russian Federation, no. Pr-2685, on 14 November, 2013). The following words and phrases mentioned in the texts were used as semantic units in the analysis: “threat”, “source of the threat”, “threat factors”, which were used within the context of the role of the human factor in ensuring security. The information contained in the strategies and concepts of ensuring security, was completed with the results of the study of scientific publications referring to the problem under study [1–4, 6–18]. Besides, there were conducted expert and methodological consultations and pilot expert survey. The latter were presented by the head of the personnel department of an oil company, a specialist of the personnel department of a trade company, the head of the security department of a higher educational institution, a production foreman of an oil company. This made it possible to ensure a complete coverage of the subjects ensuring personnel security of the organization. When the results of the consultations and pilot questionnaire were analyzed, the survey tools were revised.

2. Questionnaire survey of experts. The survey was carried out by questionnaire. The total number of the completed questionnaires was 118.

3. Statistical analysis of survey data. Analysis of the empirical distribution of expert opinions was based on the construction of the frequency tables, the calculation of medians and interquartile range (IQR). To analyze the relationship, the polychoric correlation coefficient was used [19]. For estimating the degree of consistency of expert opinions, Kendall's coefficient of concordance was used. Threats to personnel security were classified on the basis of the hierarchical factor analysis in order to identify the upper-level factor (the general level of acuteness of personnel security threats), and the lower level factors (threat types).

The data of expert survey were processed with the statistical package IBM SPSS 17.0 and the environment for statistical computing R.

4. Integration of the data and interpretation of the results.

Model

To describe the relationship between the acuteness of regional personnel security, we offer the model of hierarchical factor analysis. This model assumes that the relationship between the measured variables is due to the effect of some unobservable (latent) factors. However, these latent factors are presented in the form of a hierarchy. In this study, the variables are the indicators of personnel security threats (expressed by the experts' opinions regarding the acuteness of threats). The lower level factors are the types of threats, and the upper-level factor is understood as a general level of acuteness of personnel security threats.

The input information is a sample correlation matrix Σ for all variables. It can be represented as

$$\Sigma = \Lambda\Phi\Lambda' + \Psi, \quad (1)$$

where Λ is a factor loading matrix reflecting the relationship between the variables and factors of the lower level, Φ is a correlation matrix of lower level factors, Ψ is a covariance matrix of the specific factors. The presence of specific factors in (1) is due to the fact that extracted latent factors do not fully (with some errors) describe the correlation between the observed variables. The independence of specific factors is assumed; therefore the matrix Ψ is a diagonal with variances (specificities) on the diagonal.

The matrices Λ , Φ , Ψ are estimated. The matrix Λ is of a particular interest, but loadings are not uniquely determined, so the rotation procedure is used, so that the resulting factor structure has a meaningful interpretation. With oblique rotation, the correlation between the latent factors is assumed. On the basis of their correlation matrix Φ , one can write the equation of relationship between the upper and lower level factors. For the selected structure (with one upper-level factor) the equation has the following form:

$$\Phi = \lambda\lambda' + \Delta, \quad (2)$$

where λ is a vector of factor loadings reflecting the relationship between the lower level and upper-level factors; Δ is a diagonal matrix with specificities on the diagonal reflecting variances of errors by describing these relationships.

The resulting oblique solution with the upper-level factor can be transformed into a hierarchical solution using a Schmid—Leiman orthogonal rotation [20]. This solution allows us to estimate the indirect effects between the upper-level factor (also known as a general factor or factor g) and the observed variables.

The construction of the hierarchical factor model will enable to test the statistical hypothesis that all types of personnel security threats in the region can be attributed to a limited number of types. The interpretation of the model estimation results allows us to identify these types, and values of loading vector λ will show their effect on the general level of acuteness of personnel security threats.

Study Results

As the study results demonstrate, the experts identify the personnel security in the region as a separate concept, but they do not consider the state of the personnel security in the organization, where they work, to be a derivative of its state (Table 1). If the answers of the majority of experts to the questions referring to the state of the personnel security in the region were noticeably gravitated to the variants suggesting a higher or moderate anxiety level, then the similar assessments referring to their organizations seem to be more optimistic.

Table 1

Evaluation of the State of Personnel Security in the Irkutsk Region

Possible answers reflecting the state of personnel security	Distribution of experts' answers concerning the state of personnel security, %	
	in the region in general	in the organization
Very high (critical) anxiety level (very low security level)	2.6	0
High anxiety level (low security)	12.1	6.3
Higher anxiety level	25.0	13.7
Moderate anxiety level	47.4	28.4
Lower anxiety level	7.8	21.1
Low anxiety level (high-security level)	4.2	25.2
Very low anxiety level (very high-security level)	0.9	5.3

Source: calculated by the authors on the basis of the expert survey data.

Assessment of the Level of Acuteness and Importance of Threats to Personnel Security. The task of the study was to assess the level of acuteness of threats to personnel security in organizations in the region. As it is mentioned above, the list of such threats is compiled on the basis of the content analysis of the texts of the Russian normative legal acts in the sphere of security ensuring, and is completed with the definitions of threats to personnel security found in scientific publications. The final list contains 37 internal and external threats, which were presented to the experts for assessment. The experts were to rank the threats using a scale from 1 (acuteness and importance of the threat are minimal) to 7 (acuteness and importance of the threat are maximal). The processed results of the assessments of the respondents are given in Table 2.

Table 2

Evaluation of the Level of Acuteness and Importance of Threats to Personnel Security in the Irkutsk Region

Threats	Median	IQR	Rank
Government and business corruption in Russia	6	2	1
Fall of living standards in the region	6	2	1
Backwardness in the sphere of innovations and modernization of the economy, low innovation potential of employees	6	3	2
Outflow of highly qualified specialists from the region	6	3	2
Spread of social diseases (HIV, tuberculosis, drug addiction, alcohol dependence and others)	6	3	2
Large number of foreign labor power	6	3	2
Crisis of labor values (mindset of many employees to earn "maximum profit" against "minimum of labor outputs", stealing, and so on)	5	1.5	3
Decrease in labor motivation of employees	5	2	4
Insufficient efficiency of the state and regional management of human resources	5	2	4
Deficiency of qualified personnel on the labor market	5	2	4
Low quality of vocational training	5	2	4
Development of shadow economy	5	2	4
Violation of the rights of employees in all spheres	5	2	4
Loss of moral values, immorality	5	2	4
Growth of the number of criminal offences against personality, property	5	2	4
Wide use of extralegal practices in the regulation of social and labor relations in organizations of the region	5	2	4
Growth of social discontent of the population	5	2	4
Insufficiently effective use of the innovation potential of the regional economy	5	2	4
Low labor productivity	5	2	4
Widely spread methods of unfair competition	5	2	4
Criminalization of economy	5	2.75	5

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Health deterioration of the population	5	3	6
Population decline, depopulation	5	3	6
Deterioration of ethics of interrelations between employees and employers	5	3	6
High level of income and wage differentiation	5	3	6
High rate of unemployment	5	3	6
Low social responsibility of employers in the region	5	3	6
Ineffective trade union movement	5	3	6
Imperfect existing labor, civil, criminal legislation	5	3	6
Low legal protection of employees	5	3	6
Labor mentality of the employees which reduces loyalty to employers	5	1	7
High labor mobility	4	2	8
Low responsibility of employees	4	2	8
High employees' competition on the labor market	4	2	8
Technogenic and natural disasters	4	2	8
Deficiencies in the system of vocational training and retraining of qualified personnel in the region	4	2	8
Declining level of ethnic and confessional complementarity	4	2	8

Kendall's coefficient of concordance (W) = 0.104, asymptotic significance (p) = 0.000, which confirms the high significance of the correlation between rankings [21, p. 145].

Source: calculated by the authors on the basis of the expert survey data.

The experts considered that the most acute threat to personnel security in Russia is corruption. Nowadays, indeed, officials and politicians of various levels are involved in corruption, corruption penetrates into commercial activities, hinders fair selection of candidates for leading positions [22, p. 117], and has pronounced negative economic and social consequences [22, p. 113–114].

The first third of the rankings contains the most acute threats, including social and economic (fall of living standards in the region, wide spread of social diseases) and demographic (outflow of highly qualified specialists from the region, a large number of foreign labor power). Cultural threats including the crisis of labor values were also assessed as very acute threats.

The experts pointed a group of less acute threats, which are connected with insufficiently effective development of labor potential of employees (high labor mobility, low responsibility of employees) and of the region (high employees' competition on the labor market, deficiencies in the system of vocational training and retraining of qualified personnel in the region), as well as declining level of ethnic and confessional complementarity, technogenic and natural disasters.

The presented ranking of threats makes it possible to come to a conclusion that internal threats to personnel security dominate in the region.

Each respondent could complete the list with his/her own definitions of threats, but none of the experts took the opportunity. Thus, it can be concluded that the list of threats, compiled as a result of the content analysis, is complete and sufficient.

The impact of individual threats to the perception of the level of personnel security in general. It can be assumed that there is a certain interrelation between the assessment given by an individual expert to the level of security in general and his/her perception of which threats are of the upper priority. The combination of such interrelations can be interpreted as a contribution of each threat to the perception of the level of personnel security in general [23].

In order to test this hypothesis, the correlation analysis was carried out, where the following characteristics were used as comparable variables: "degree of acuteness of the i -th threat to personnel security" (where i is the index of the threat on a scale from 1 to 37) and "anxiety level relative to personnel security in the region in general." The values of the calculated polychoric correlation coefficients (R) are presented in Table 3.

The anxiety level relative the state of personnel security in the region has a maximum positive relation with the perception of the acuteness of the threat "fall of living standards in the region": the lower living standards are assessed, the greater fears are connected with the state of personnel security in the region.

Results of Hierarchical Factor Analysis of Threats to Personnel Security

Types of threats	Types of threats (factors of the lower level)						R	Factor g
	1	2	3	4	5	6		
High level of unemployment	0.86							0.46
Growth of social discontent of the population	0.69							0.51
Growth of the number of criminal offences against personality, property	0.63							0.45
Crisis of labor values	0.62							0.48
Large number of foreign labor power	0.57							0.56
Imperfect existing legislation	0.56						0.21	0.57
Deficiencies in the system of vocational training and re-training of qualified personnel in the region	0.54							0.49
Spread of social diseases (HIV, tuberculosis, drug addiction, alcohol dependence)	0.53							0.55
Loss of moral values, immorality	0.44							0.53
Outflow of highly qualified specialists from the region	0.41							0.52
Technogenic and natural disasters	0.39		0.55					0.51
Low social responsibility of employers in the region		0.86						0.59
Violation of the rights of employees in all spheres		0.78						0.60
Low legal protection of employees		0.75						0.63
Ineffective trade union movement		0.69						0.40
Widely spread methods of unfair competition		0.46						0.57
Wide use of extralegal practices in the regulation of social and labor relations in organizations of the region		0.44						0.54
Deterioration of ethics in interrelations between employees and employers		0.37		0.55				0.42
Development of shady processes in the economy		0.25	0.43					0.50
Labor mentality of the Russians which reduces loyalty to employers		0.24		0.41				0.34
Backwardness in the sphere of innovations and modernization of the economy, low innovation potential of employees			0.83					0.36
Population decline, depopulation			0.70					0.36
Health deterioration of the population			0.61					0.46
Fall of living standards in the region			0.54				0.36	0.59
Insufficiently effective use of the innovation potential of the regional economy			0.39			-0.42		0.49
Low responsibility of employees				0.82				0.30
High labor mobility				0.57				0.28
Low labor productivity				0.57			0.26	0.45
Low quality of vocational training				0.52			0.23	0.48
High employees' competition on the labor market				0.47				0.33
Deficiency of qualified personnel on the labor market				0.34			0.23	0.32
Insufficient efficiency of the state and regional management of human resources					0.69			0.36
Decrease in labor motivation of employees					0.57			0.30
High level of income and wage differentiation					0.32		0.26	0.41
Government and business corruption in Russia						0.78		0.26
Criminalization of economy						0.45	0.24	0.45
Declining level of ethnic and confessional complementarity						-0.32	0.22	0.55

In Table, an interpretable loading (showing its correlation with the threat type, which it identifies), is given for each indicator, as well as maximum loading in absolute magnitude, if it does not coincide with the interpretable one.

Source: calculated by the authors on the basis of the expert survey data.

Among other threats, such threats as low labor productivity, high level of income and wage differentiation, criminalization of economy, deficiency of qualified personnel on the regional labor market are more closely connected with the overall assessment of the state of personnel security. The overall assessment is less connected with such threats as declining level of ethnic and confessional complementarity, low quality of vocational training, imperfect existing legislation.

It should be mentioned that absolute values of correlation coefficients have turned out to be not large, nevertheless, the results of the correlation analysis show that there is a statistically significant relationship between the key factors of the formation of the anxiety level of the experts and the level of personnel security in general.

Types of threats to personnel security. In order to identify the “associated” (in the perception of experts) personnel security threats, the hierarchical factor analysis is used. As a result, six lower level factors are extracted. The method of generalized weighted least squares was used as a factoring method. The oblique (oblimin) rotation is performed [24, p. 218]. The results of the parallel analysis [25] show that the obtained factor structure does reflect the observed relationship between the threats to personnel security, and it is not an accidental result, and all the six extracted factors are correctly included in the model.

Table 3 shows the values of the factor loadings for the extracted lower level factors. They indicate the degree of effect of these factors on the evaluated by experts degree of acuteness of each type of personnel security threats.

The following factors can be considered as the types of threats to personnel security in the region:

- 1) threats connected with the low labor potential in the region due to lowering of its quantitative and qualitative characteristics;
- 2) legal threats including those caused by ethical problems in interrelations of the subjects of social and labor relations;
- 3) threats caused by the low innovation potential and living standards of the population;
- 4) threats connected with the low quality of labor power, its competitive weaknesses;
- 5) threats caused by weaknesses and errors of the regional government in the sphere of human resource management;
- 6) criminal threats including corruption and criminalization of economy.

Thus, the hypothesis that all types of threats to personnel security in the region could be attributed to a limited number of types has been confirmed statistically and meaningfully.

While answering the questionnaire, the experts assessed the importance of each threat separately. At the same time, the value of the factor variable of the upper level (factor g) can reflect the importance of threats to personnel security for the expert in general. That is why on the basis of the correlation matrix of the lower level factors, the principal component is extracted, which is considered as the general level of acuteness of threats to personnel security. This component loadings, in other words, the degree of its effect on the lower level factors are presented in Table 4.

Table 4

Impact of Different Type Threats to the General Level of Acuteness of Threats to Personnel Security

Types of threats	Principal factor
Threats connected with the low labor potential in the region due to lowering of its quantitative and qualitative characteristics	0.58
Legale threats including those caused by ethical problems in interrelations of the subjects of social and labor relations	0.65
Threats caused by the low innovation potential and living standards of the population	0.48
Threats connected with the low quality of labor power, its competitive weaknesses	0.47
Threats caused by weaknesses and errors of the regional government in the sphere of human resource management	0.27
Criminal threats including corruption and criminalization of economy	0.04

Source: calculated by the authors on the basis of the expert survey data.

The legal threats and threats connected with the low labor potential in the region contribute most substantially to the general level of the perception of the acuteness of threats. Consequently, in order to ensure personnel security in the region, the following directions should be considered as priorities:

increasing the level of social responsibility of employers in the region, including deliberate withdrawal from shadow forms of social and labor relations, observation of the labor legislation, and solving of social and demographic problems.

Discussion of Results and Conclusion

The article describes the solving of the problem of the identification of threats to personnel security in the region, assessment of the level of their acuteness to personnel security in the Irkutsk Region. The study resulted in the extraction of the so-called factor *g*, which is based on the assumption that all the threats are caused by one common factor — the general level of the acuteness of threats to personnel security.

The obtained factor *g* loadings (Table 3) have a low correlation with the raw experts' scores (Table 3, column *R*). This can indicate the fact that the experts, while assessing the level of personnel security in the region in general, failed to give the same assessment to the general level of personnel security, which would not contradict to their personal assessments. Possibly, the experts intuitively took into consideration other types of threats.

Nevertheless, the proposed approach to the assessment of the acuteness of threats to personnel security in the region is accessible and relatively simple, it is an efficient instrument to assess results of the regional policy aimed at the adjustment of social and labor relations, it can be used to elaborate measures aimed to identify and prevent threats to personnel security, and to take countermeasures.

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